

ABSTRACT

A variable gauge drilling apparatus and a method for assembling a variable gauge drilling apparatus for insertion in a subject borehole. The variable gauge drilling apparatus includes: an apparatus housing having a housing size which is suitable for insertion in a subject borehole which has a subject borehole size within a design range of borehole sizes; a plurality of interchangeable borehole engaging devices having different device sizes for mounting on the apparatus housing to provide the drilling apparatus with a drilling apparatus size within a range of drilling apparatus sizes, wherein the range of drilling apparatus sizes is compatible for use of the drilling apparatus within the design range of borehole sizes; and a universal borehole engaging device mount located on the apparatus housing, wherein the mount is configured to accept for mounting any one of the plurality of interchangeable borehole engaging devices.